

# Processor for Real-Time Atmospheric Compensation in Long-Range Imaging, Phase I

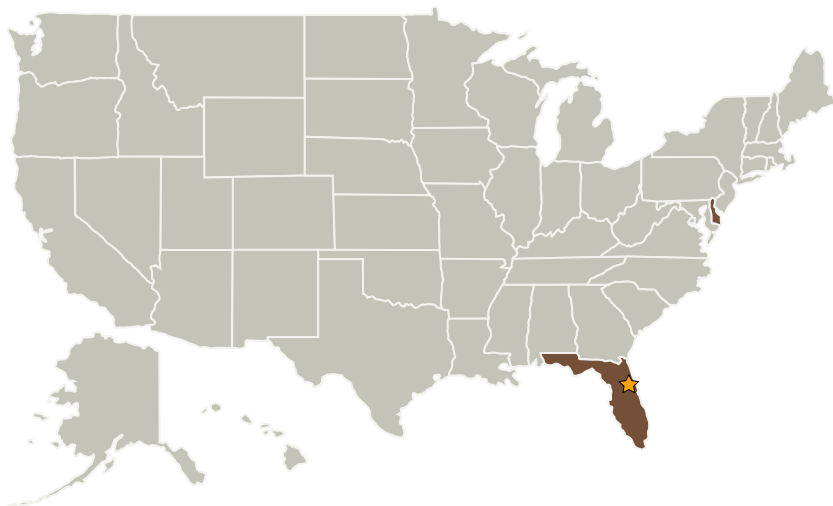
Completed Technology Project (2006 - 2006)



## Project Introduction

Range surveillance is a critical component of space exploration because of its implications on safety, cost, and overall mission timeline. However, launch delays, due to the difficulty of verifying a cleared range, are common and will increase as spaceports are developed in new areas. In order to expedite range clearance, it is vital to see "through" the atmosphere. Unfortunately, the quality of the images taken with long-range optical systems is severely degraded by atmospheric movements in the path between the region under observation and the imaging system. We therefore propose the use of custom hardware, specifically designed to compensate for atmospheric disturbances in long range imaging. Furthermore, we propose the use of a reconfigurable hardware platform, specifically field-programmable gate arrays (FPGAs), to reduce costs and development time, as well as increase flexibility and reusability. Alternative hardware platforms are not well suited for this particular application. Our unique approach would allow a single device, with the computational power of a computer cluster, to be used for not only atmospheric compensation, but also encrypted communications, audio and video encoding/decoding and transmission, neural network implementations, etc. The applications of such a technology are virtually limitless!

## Primary U.S. Work Locations and Key Partners



Processor for Real-Time  
Atmospheric Compensation in  
Long-Range Imaging, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission  
Directorate (STMD)

### Lead Center / Facility:

Kennedy Space Center (KSC)

### Responsible Program:

Small Business Innovation  
Research/Small Business Tech  
Transfer

## Processor for Real-Time Atmospheric Compensation in Long-Range Imaging, Phase I

Completed Technology Project (2006 - 2006)



Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
EM Photonics, Inc.	Supporting Organization	Industry	Newark, Delaware

Primary U.S. Work Locations	
Delaware	Florida

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX16 Air Traffic Management and Range Tracking Systems
  - └ TX16.5 Range Tracking, Surveillance, and Flight Safety Technologies